NREL
NATIONAL RENEWABLE ENERGY LABORATORY

Worldwide Energy Efficiency Action through Capacity Building and Training (WEACT)

Building Efficiency Part 1: Overview

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29 September 2010
Mexico City

WEACT is a subtask of the International Partnership for Energy Efficiency Cooperation (IPEEC)

Training Objective for Building Module

Provide participants with the tools needed to create a policy **action plan** for building efficiency, through:

- Review of building efficiency policy types
- In-depth review of select policies, including examples
- Discussions based on your experiences
- Steps needed to design and implement building efficiency policies
- On-line resources, described in the presentations and hand-outs

Training Session Outline

Overview of policy options

In-depth policy review

Policy design

Policy implementation

Group exercise

What is building energy efficiency?

Building Energy Efficiency (technical definition)

- The extent to which the energy consumption per m^2 of floor area of the building measures up to established energy consumption benchmarks for that particular type of building under defined climatic conditions

Building energy consumption benchmarks

- Representative values for common building types against which a building's actual performance can be compared

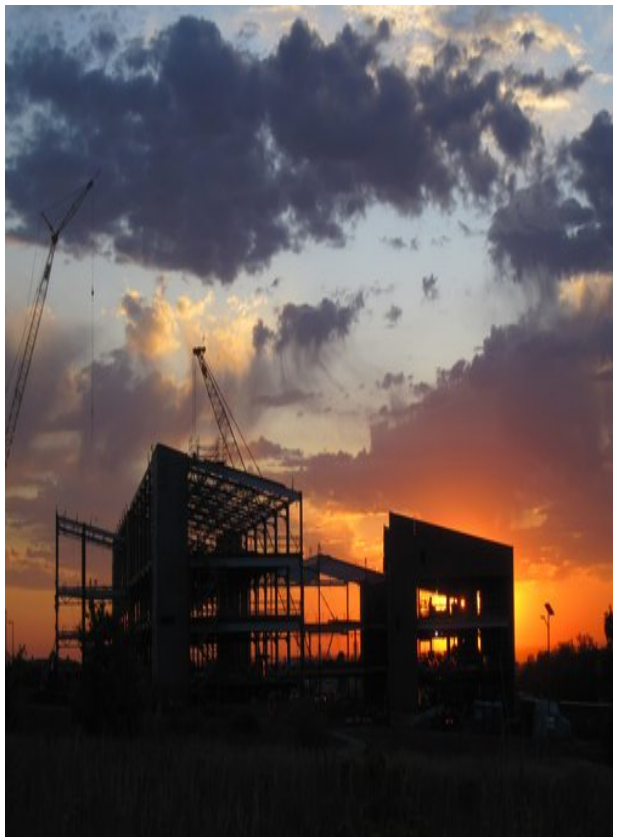
Why do we want building efficiency?

Buildings consume 40% of global energy

Many benefits

- Cheaper and faster than increasing energy supply
- Improved comfort
- Energy security
- Poverty alleviation
- Job creation
- Improved productivity
- Environmental benefits

Why do we need building efficiency policies?



Many market barriers to efficiency

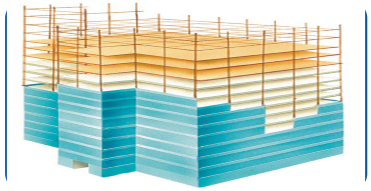
- Informational
- Institutional
- Behavioral
- Economic

To address so many barriers, need comprehensive set of policies

But policy barriers exist too

- Although can draw lessons from like markets, local markets require local solutions
- Efficiency is hard to measure; requires consistent and credible data

Policy Types



Building codes

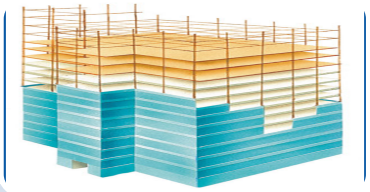
Incentives

Information programs

Training and capacity building

Public leadership programs

Building Codes



Examples	• Prescriptive (minimum performance requirements for building components; limited flexibility, easy to follow) • Performance (maximum energy consumption for whole building; more economically efficient; more innovations)
Pros	• Effective if enforced, addresses many barriers
Key challenges	• Enforcement, workforce training, motivating compliance, can be highly political, largely ignores existing buildings
Next steps	• Base codes on 30-year least lifecycle cost • Increase market for low- and zero-energy homes • Require renovations to meet new codes

Incentives

Examples	• Reduce upfront costs: grants, tax credits, subsidies • Improve access to financing: loans, interest rate buy-down, energy performance contracts, PACE • Address split incentives: green leases • Non-financial: recognition programs, expedited permitting, dispensation from other codes (e.g., height restrictions)
Pros	• Cost often key barrier; works well in policy combinations
Key challenge	• Possible budget expense
Next steps	• Energy performance contracts • Remove fiscal disincentives (e.g., fuel cost tax deductions)

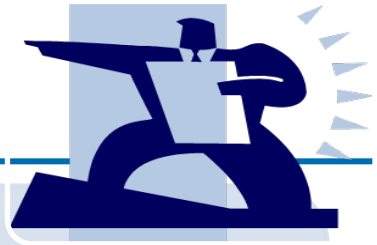
Information Programs

Examples	• Awareness Raising: pilot programs; demonstration sites; mandatory audits; public advertisements • Labeling and Certification: building energy performance disclosure; commissioning; high-performance labels; benchmarking
Pros	• Reach large audience; addresses new and existing building stock
Key challenges	• Improved information ≠ action; audit quality; certification is building-specific
Next steps	• Require efficiency audit and rating (e.g., EU Building Pass) • Encourage or require commissioning of new buildings • Raise awareness of the value of dedicated energy managers

Trainings and Capacity Building

Human Capacity Building examples	• Efficiency included in basic building-related curricula • Trainings for standard setting, code enforcement, audits, data collection and evaluation, building energy management, integrated building design, and financing options
Institutional Capacity Building example	• Creation of energy agencies to implement efficiency programs
Pros	• Addresses a key barrier in many countries
Key challenge	• Can be complex and time-consuming
Next steps	• Train and accredit building design and construction specialists in integrated building systems • Create networks of experts; provide training & webinars • Train and deploy outreach agents

Public Leadership Programs



Examples	• Stronger codes for public buildings • Efficiency goals & requirements to track and report progress • Training and technical assistance for building managers • Energy performance contracting
Pros	• Large potential for energy savings and market transformation, particularly for ESCOs; cost-effective use of public money
Key challenge	• Training building managers, ESCO capacity
Next steps	• Institute aggressive efficiency standards for government buildings • Expand the capacity for sub-national public agencies

Policy Combinations

Policy portfolios—more value than the individual measures combined

- Policies reinforce each other
- Market barriers are multiple—need multiple policies to overcome even one barrier

Examples

- Mandatory audits & capacity building for auditors & financial incentives (rebates, ESCO financing…)
- Labeling & financial incentives
- Building codes and subsidies or awards
- Public leadership programs and policies to support energy performance contracts

Policy Combinations: IEA Recommendations

Among IEA's 25 efficiency recommendations, 5 address buildings:

1. Mandatory and strengthened building codes for **new buildings**
2. Support for **passive energy houses** and **zero energy buildings**
3. Incentives to retrofit **existing buildings**
4. Share information through **building certificates**
5. Improved standards for **windows** and other glazed areas

http://www.iea.org/papers/2008/cd_energy_efficiency_policy/0_introduction/EffiRecommendations_web.pdf

Discussion Questions

What building policies do you want to learn more about?

Which policies (1-2) are the easiest to implement in your country and would have applicability throughout the region?

Which policies (1-2) offer the most cost-effective energy savings in your country and could apply elsewhere in the region?